

Prospective Study of the Psychiatric Disorders of Childbirth

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Summary: A representative sample of 105 women were assessed by Goldberg's Standardised Psychiatric Interview (SPI) on two occasions during pregnancy and twice more in the puerperium. Total SPI scores increased significantly after childbirth. Thirteen out of the sample had a severe postnatal depression and a further 17 women had milder depression, which in 15 lasted at least four weeks. Marked deterioration of their marital relationships was reported by the depressed women but no other social or obstetric characteristics of postnatal depression were found. Women with severe postnatal blues were particularly at risk of developing persistent depressive symptoms subsequently. The only two women referred to a psychiatrist had personality disorders rather than depressive illnesses.

There is substantial evidence that at least 10 per cent of women have a depressive illness in the puerperium (Pitt, 1968; Nilsson and Almgren, 1970; Kumar and Robson, 1979). Postnatal blues (temporary depression or lability of mood in the first ten days after delivery) is reported by a yet higher proportion—up to 50 per cent in some series (Robin, 1962; Yalom *et al*, 1968; Pitt, 1973).

The investigation described in this paper is a prospective study of psychiatric disorders associated with childbearing in a representative sample of women attending a hospital antenatal clinic in Edinburgh—a city where almost all deliveries take place in hospital.

Method

The study sample was a series of women who, between January 1978 and November 1979, attended the antenatal clinics at the Simpson Memorial Maternity Pavilion (Edinburgh Royal Infirmary) where all were personally interviewed on four occasions. A larger sample ($n = 425$) who completed self-rating questionnaires will be described in a further paper, and a subsidiary study of a subsample who completed daily mood ratings for three weeks after childbirth has been reported already (Kendell *et al*, in press).

At each antenatal booking-in clinic the patient with the first listed appointment was selected for interviewing, provided that she lived in Edinburgh and her pregnancy was not of more than 20 weeks' gestation. Three women were excluded because of language difficulties.

Of the 114 women admitted to the study, 105 delivered live babies at the Simpson Maternity Pavilion. Nine were lost to the sample (four had spontaneous abortions, one a stillbirth, one an ectopic pregnancy, two could not remain for the initial interview and one left Edinburgh before delivery).

The first interview (ANI) took place at the first visit to the antenatal clinic ($n = 105$); the second (ANII) at a subsequent visit, at or about 35 weeks' gestation ($n = 100$); the third (PNI) within ten days of delivery ($n = 91$) and the fourth (PNII) at home, usually within three to five months of delivery ($n = 103$). Only two women were not interviewed at PNII; one had moved twice since childbirth and could not be traced, and the other was tearful when contacted by telephone and declined to be interviewed.

The Standardised Psychiatric Interview (SPI) of Goldberg *et al* (1970) was administered by Y.C. on each occasion. The SPI includes 10 five-point scales which rate the severity of neurotic symptoms in the seven days preceding the interview, and also 12 observer ratings of the mental state. The SPI, which had been used previously by J.L.C. in a study of childbearing African women (Cox, 1979; 1981), covers much the same ground as an ordinary clinical interview so that a psychiatric diagnosis can be made and the following four-point clinical intervention rating completed: 0 = no significant psychiatric symptoms; 1 = minor symptoms, not requiring treatment by a general practitioner; 2 = need for active treatment by general practitioner; 3 = need for psychiatric referral; and 4 = need for in-patient psychiatric treatment. Other personal, social and

demographic information was also recorded, and obstetric data obtained from the medical case notes.

All the SPI ratings were made at ANI and PNII. To shorten the interviews at ANII and PI certain items, such as fatigue and obsessions, were omitted. Anxiety, depression, irritability, sleep disturbance and the 12 observer ratings were assessed on each occasion.

Y.C. and J.L.C. conducted 20 research and 50 pilot interviews jointly, and any differences in ratings were discussed. Interviews which Y.C. carried out alone were also carefully reviewed with J.L.C., and an appropriate clinical intervention rating and psychiatric diagnosis agreed.

ANI: This took place in a quiet room adjacent to the antenatal clinic. The other variables rated at this stage included premenstrual tension and pain, whether the pregnancy was welcomed, and financial difficulties. Personality assessment was restricted to establishing whether the subject regarded herself as a worrier, and if so, whether the worrying was present without adequate cause.

ANII: This usually also took place at the antenatal clinic. A previous psychiatric history was obtained and any family history of psychiatric disorder. Contact with a general practitioner because of nervous problems during pregnancy was also recorded.

PNI: This was carried out for 80 per cent of pro-

bands in the postnatal wards, and took place usually within one week of delivery. Ten women were interviewed at home, after discharge from hospital, and 14 could not be interviewed at all because of early discharge due to unexpected closure of a postnatal ward. A three-point rating of the 'blues' was made as follows: 0 = nil; 1 = milder mood disturbance; 2 = severe, i.e., two or more SPI symptoms each rated 2+ and causing definite distress noticeable to others.

PNII: This was conducted at home, usually between three and five months after childbirth. Separate SPI ratings were made for (a) symptoms present between PNI and seven days before PNII, and (b) symptoms experienced in the seven days prior to interview. We recorded any consultation with a general practitioner because of nervous problems since delivery, any change in the marital relationship, any social impairment caused by psychiatric disorder, four-point scales of maternal concern about the baby's vomiting, crying, sleeping and feeding, and whether the mother had been separated from her baby in a special care unit for more than 24 hours or had been discharged from hospital with or without it.

Results

The subjects

The mean age was 26 years; only four mothers were

TABLE I
Characteristics of sample (*n* = 105)

		N	%
<i>Marital status</i>	Married	96	92
	Cohabiting	3	3
	Single	4	4
	Separated	1	1
	Divorced	1	1
<i>Social class</i>	I	17	17
	II	22	22
	III	42	41
	IV	10	10
	V	4	4
	Army wives	3	3
	Not known	3	—
<i>Employment at time of ANI</i>	Housewife	52	51
	Part-time paid work	14	14
	Full-time paid work	37	36
	Not known	2	
<i>Gravidity</i>	First pregnancy	38	37
	Second pregnancy	39	38
	Third pregnancy	19	18
	Fourth or more	7	7
	Not known	2	2

TABLE II
Change in total SPI score at ANI, ANII, PNI and PNII ($n = 89$)

Interview	SPI mean score	Standard deviation		
ANI	4.1	4.9	$t = 1.34, NS$ $t = 1.32, NS$ $t = 2.59, P < .01$	$t = 2.53, P < .02$
ANII	5.0	5.4		
PNI	5.9	5.7		
PNII	3.9	5.0		

P values based on paired t-test.

younger than 20 and only five older than 34. Other characteristics of the sample are shown in Table I.

Comparison of these 105 women with the maternity discharge records of the 35,729 women who delivered babies at any of the five obstetric units in Edinburgh between 1971 and 1977 did not reveal any important differences on either socio-demographic or obstetric variables.

SPI total scores

The mean total scores of all women interviewed on the same four occasions and the significant increase at PNI are shown in Table II. The total SPI score used in this analysis was the sum of the depression, anxiety, irritability and sleep disturbance ratings plus twice the sum of the mental state ratings. When the sleep disturbance rating, which may have been influenced by physical factors such as abdominal discomfort, was omitted, the differences between means at ANI and PNI and between PNI and PNII remained significant (Fig 1).

Because these changes in total SPI scores may conceal important differences in the pattern of change in individual symptoms, the changes in anxiety, depression, irritability and sleep disturbance between the four interviews were examined separately, and are shown in Fig 2. Depression more than doubled at PNI, whilst anxiety, which was more prominent than depression at ANI, increased during pregnancy to a maximum at PNI, before falling to its lowest level at PNII. Irritability, on the other hand, which was maximal during pregnancy, decreased at PNI. Sleep disturbance was maximal during the third trimester, probably because of abdominal discomfort and nocturia. These differences between ANI and PNI and between PNI and PNII were significant both for anxiety ($P < .05$ and $P < .01$) and for depression ($P < .001$ and $P < .001$) using the paired t-test. The increase in sleep disturbance between ANI and ANII

was also significant at the 0.1 per cent level, whilst the decrease in irritability between ANI and PNI was significant at the 1 per cent level.

Of the 11 high-scorers (SPI total score of 10+) at PNII, eight had not been high-scorers at ANI or ANII, and seven of these eight new high-scorers had a definite depressive illness. Six out of the 8 reported a deterioration in their marital relationship, compared with only six of the remaining 81 women (Fisher's Exact Test, $P < .001$). Three reported that their husbands had urged them to consult a doctor, and all were concerned by the deleterious effect of their

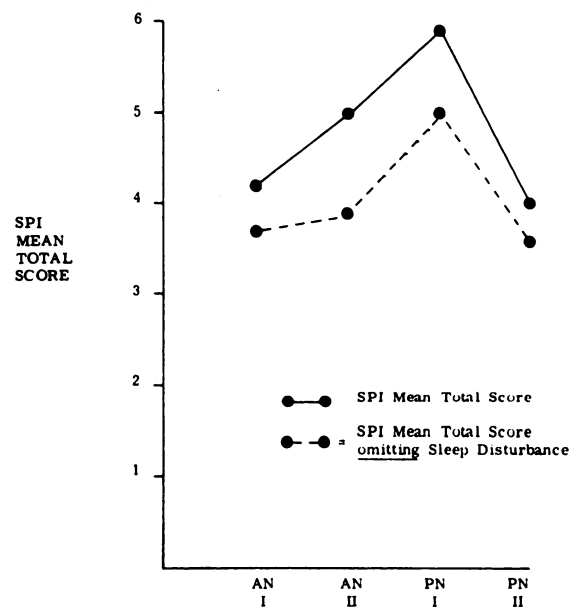


FIG. 1

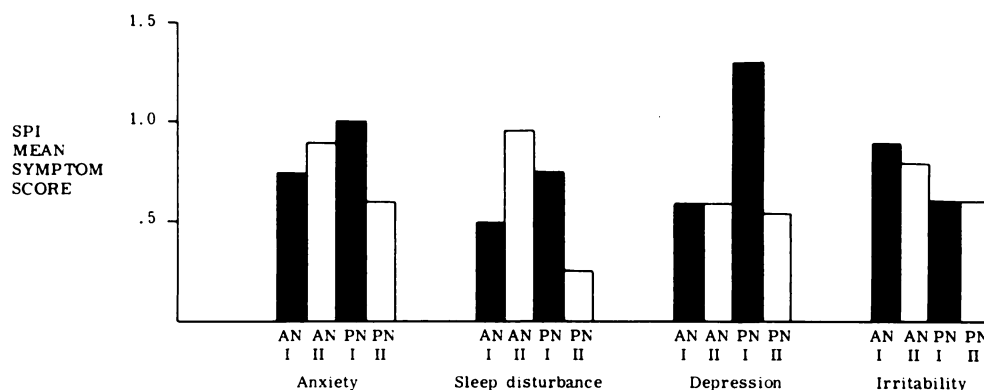


FIG 2.

depressed mood on the marriage; loss of libido was a prominent complaint in four, compared with only four of the other 81 women (Fisher's Exact Test, $P < .001$). Two of the eight were so worried about their baby's sleeping difficulties or crying that they had asked for help from their general practitioner or health visitor.

Unlike the eight new high-scorers in the puerperium, only two of the 10 high-scorers at ANI and ANII had a psychiatric disturbance which required treatment, and both of these had additional difficulties, one having Hodgkin's Disease and the other an aunt who had recently died. The antenatal high-scorers were often worried about being pregnant or their future baby's health, but only rarely described marked depressive symptoms.

Postnatal depression

Thirteen women (13 per cent) had a depressive illness at PNII which fulfilled Pitt's (1968) criteria, compared with only 4 per cent during pregnancy. This illness impaired their ability to carry out household tasks and caused much family distress. Most of these women were also distressed by their difficulty coping with their baby, became excessively concerned about its health and doubted their ability to be good mothers. A further 17 (16 per cent) had milder depressions which, though they had remitted by PNII, nonetheless lasted at least four weeks in all but two. They were all quite definite in their description of having been depressed and anxious; they were also troubled by their inability to live up to their own high expectations of motherhood. Despite these widespread depressive symptoms, they reported no delusions, hallucinations, psychomotor retardation or serious suicidal thoughts.

The other postnatal psychiatric diagnoses included two women with obsessive compulsive neuroses and one with agoraphobia. The only two women referred

to a psychiatrist both had personality disorders. One was so distressed that a place of safety order had to be considered for her unborn child, whilst the other complained of numerous somatic symptoms. A third mother, who had taken an overdose of tablets after a family quarrel, had been admitted to a general hospital. Sixteen women said they had consulted their general practitioner because of nervous trouble in the puerperium, compared with 4 per cent in the second and third trimesters. Only rarely was anti-depressant medication prescribed, although 19 (18 per cent) were judged to merit active treatment from their general practitioner and four to need referral to a psychiatrist.

Psychiatric morbidity and associated variables

The relationship between total SPI scores and those factors which seemed likely, or which others had claimed, to be associated with psychiatric morbidity is shown in Table III.

Women from social classes IV and V were more likely to have higher SPI scores during pregnancy, but this association did not quite reach a statistical significance.

No association was found between postnatal psychiatric morbidity and primiparity, assisted delivery, prolonged labour, induced labour or breastfeeding.

Of the 16 women with severe 'blues', depressive symptoms persisted in seven, and in four were still present at PNII. These women were more likely than others to have been discharged with their baby still in hospital (Fisher's Exact Test, $P = .02$) although, curiously, no such association was found if the baby had been in the special care unit.

Discussion

Our finding that a postnatal depressive illness occurred in 13 per cent of the sample, and that a

TABLE III
SPI score and social variables for the 89 subjects interviewed on all four occasions

	ANI P values*	ANII P	PNI P	PNII P
Unmarried status	= .02	NS	NS	NS
Financial worries	= .01	< .01	NS	NS
'Always been a worrier'	< .001	< .01	NS	< .05
Mother of subject not alive	NS	NS	< .01	NS
Deteriorating relationship with husband after delivery	—	—	NS	< .001
Decrease in sexual satisfaction after delivery	—	—	NS	< .02

* P values are based on one-way analysis of variance.

further 16 per cent had depressive symptoms distinct from the blues of the first ten days, indicates that psychiatric morbidity is a common and disabling complication of the puerperium and is predominantly depressive in nature. Furthermore, the deterioration in the marital relationship and the reduced libido suggests that this postnatal depression is associated with considerable family vulnerability. Depression was also the most commonly reported symptom in the week after delivery, and in seven of the 16 women with severe postpartum blues the depression persisted, and in four lasted several months. The blues are not correctly described therefore as either trivial or fleeting, and may in fact be an important predictor of women at risk of developing a depressive illness later on.

The women with postnatal depression were similar in most respects to those described by Pitt (1968). Yet, although those women were distressed and bewildered by their inability to cope, they only rarely reported their depressed mood to their general practitioner. Several described themselves to us as being "down in the dumps" or having a "general melancholy", or said they "couldn't buck up" or that they were like "Jekyll and Hyde".

The majority of women tried to continue with their household tasks and to meet their husbands'—as well as their babies'—demands.

The finding that women whose own mothers were dead were more likely to experience psychiatric symptoms immediately after childbirth, but not in the late puerperium, is of interest and might indicate that important psychological processes such as a heightened identification with one's own mother are particularly important at this time. However, women having their first baby or those who were delivered by

Caesarean section or with forceps were not more likely than others to be depressed.

Although we did not investigate directly the possible contribution of hormonal changes to mood disturbance in the puerperium, our finding that psychiatric symptoms were maximal in the ten days after delivery, when the fall in oestrogen and progesterone levels is maximal, and our failure to find any association with social factors, marital status or obstetric complications provide indirect support for the endocrine hypothesis. It is possible, therefore, that endocrine factors are the physiological triggers which may initiate mood changes at this time, although the actual mood experienced may be determined by the recall of poignant family memories or by the prevailing atmosphere in the postnatal ward. This interaction between physiological and psychological factors is certainly complex. A model for understanding these initial puerperal mood disturbances (and, possibly, the more protracted postnatal depression) is provided by the studies of Schachter and Singer (1962) who injected adrenalin into subjects unfamiliar with the physiological effects of the injection. They subsequently showed that the aroused subjects' mood and behaviour were strongly influenced by the environment, especially by the behaviour of others, and that this influence was greatest for subjects who had had no advanced warning about the effects of the injection.

During pregnancy, anxiety was common, and usually reflected the mother's concern about the impending delivery and whether or not the child would be healthy, whilst depression was much less common and was not of the same intensity as that found in the puerperium. This finding is different to that of Kumar and Robson (1979) in London, who found 16 per cent of their sample of married primi-

gravidae to be depressed during pregnancy. However, more of their patients had had a previous psychiatric contact (14 per cent as against only 8 per cent of ours) and more had had a previous termination of pregnancy (18 per cent as against only 9 per cent of ours).

Unmarried women were more likely to report distressing psychiatric symptoms during early pregnancy than others, but such women were not more at risk once delivery had occurred; a finding somewhat similar to that found in African women (Cox, 1979) despite the very considerable differences in the obligations of the marriage contract in the two cultures.

Antenatal anxiety was not found to be predictive of postnatal depression, so we could not confirm the earlier findings of Tod (1964) and Dalton (1971). Indeed our results showed that, in seven women at least, postnatal depression occurred in women who were almost symptom-free during pregnancy.

The similarity of mean SPI scores between ANI and PNII, and yet the three-fold increase in depressive illness in the puerperium, shows the disadvantage of relying on total symptom scores as a measure of psychiatric morbidity in childbearing women. This raises important theoretical and practical issues concerning the use of self-rating questionnaires in childbearing women which will be discussed further in a subsequent paper.

The recognition and treatment of postnatal depression is complicated by the changes in medical attendants between hospital and home. Although depression was frequently found in women still in the postnatal ward, depressive illnesses developed later after discharge from hospital. Therefore communication between midwives in hospital and in the community, and between hospital doctors and general practitioners is important if depressed women are to be identified. Our findings suggest that when women attend for their postnatal examination a simple clinical enquiry would enable the more severely depressed to be detected.

The high rates of postnatal psychiatric morbidity found in this study are not easily reconciled with the expectation that women should return to full domestic functioning soon after childbirth, and it is of interest that some more traditional African societies have a lying-in period after childbirth and a taboo on sexual relationships.

It is possible that, when depression occurs in the puerperium, its long-term effect on the marriage and on the mother-child relationship may be more serious than if it occurs at another time. For this reason subjects in the present study who developed puerperal depressions are being investigated further to determine whether or not there have been enduring

adverse effects on marriages or on the behaviour of children.

Our findings, together with the known increase in the risk of major psychoses after childbirth, confirm that potent aetiological factors are operating in the puerperium, and that the increase in psychiatric consultation rates after childbirth is not likely to be an artefact of a lowered threshold for patient consultation, or for hospital referral.

However, not all women with severe depressive illness are referred to a psychiatrist, and none of the four women in our study who in our opinion required psychiatric help were so referred. Ironically, neither of the two women who were referred was depressed; both had personality disorders.

Nevertheless, even if psychiatrists are unlikely to be involved directly in treating most postnatal depressions, their task in teaching midwives, health visitors and general practitioners is important. At present, the training of these groups is inadequate, and is also hindered by the total neglect of postnatal depression in some standard midwifery textbooks (see Myles, 1975).

Acknowledgements

We are indebted to Mr R. McGuire for his advice with computing and help with the statistical analysis.

We also thank the obstetricians at the Simpson Maternity Pavilion, the senior nursing officer, other nursing staff and the women themselves.

The research was supported by a grant from the Scottish Home and Health Department.

References

- COX, J. L. (1979) Psychiatric morbidity and pregnancy: A controlled study of 263 semi-rural Ugandan women. *British Journal of Psychiatry*, **134**, 401–5.
- Postnatal depression: A prospective study of Ugandan women. *Social Psychiatry* (in press).
- DALTON, K. (1971) A prospective study into puerperal depression. *British Journal of Psychiatry*, **118**, 689–92.
- GOLDBERG, D. P., COOPER, B., EASTWOOD, M. R., KEDWARD, H. B. & SHEPHERD, M. (1970) A standardized psychiatric interview for use in community surveys. *British Journal of Preventive and Social Medicine*, **24**, 18–23.
- KENDELL, R. E., MCGUIRE, R. J., CONNOR, Y. & COX, J. L. Mood changes in the first three weeks after childbirth. *Journal of Affective Disorders* (in press).
- KUMAR, R. & ROBSON, K. (1979) Neurotic disturbance during pregnancy and the puerperium: Preliminary report of a prospective study of 119 primae gravida. In *Mental Illness in Pregnancy and the Puerperium* (ed. M. Sandler). Oxford.

- MYLES, M. (1975) *Textbook for Midwives (Eighth Edition)*. Edinburgh: Churchill Livingstone.
- NILSSON, A. & ALMGREN, P. E. (1970) Paranatal emotional adjustment: A prospective investigation of 165 women. *Acta Psychiatrica Scandinavica*, Supplement 220.
- PIIT, B. (1968) 'Atypical' depression following childbirth. *British Journal of Psychiatry*, 114, 1325-35.
- (1973) Maternity blues. *British Journal of Psychiatry*, 122, 431-3.
- ROBIN, A. (1962) Psychological changes in normal parturition. *Psychiatric Quarterly*, 36, 129-50.
- SCHACHTER, S. & SINGER, J. E. (1962) Cognitive, social and physiological determinants of emotional state. *Psychology Review*, 69, 379-99.
- TOD, E. D. M. (1964) Puerperal depression: A prospective epidemiological study. *Lancet*, ii, 1264-6.
- YALOM, I. D., LUNDE, D. T., MOSS, R. H. & HAMBURG, D. A. (1968) 'Postpartum blues' syndrome. *Archives of General Psychiatry*, 18, 16-27.

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(Received 1 June; revised 2 September 1981)